



## **Detection of irrigated crops from Sentinel 1 and Sentinel 2 data to estimate seasonal water use. A case study: Banat pilot area, Romania**

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Banat regio is located in the South-West of Romania bordered by the Mures river in the north, the confluence between Danube and Cerna rivers in the south, Romanian – Serbian border in the west and the Jiu river in the east. The irrigation system that cover 10,500 hectares is served by a collective irrigation system based on central and liner pivots, supplied with water from the Bega, Mures and Ier rivers. This helps farmers to adapt their irrigated practices to local water variability. For an effective optimization of irrigation water and detection of non-authorized abstraction in the Banat region, we propose to analyze crop phenology in the growing season during 2005-2017 period taking into consideration rainfall regime, soil conditions and crop type. The combination between vegetation indices retrieved from Sentinel 2 data and soil moisture estimated from dual polarized Sentinel-1 data is used as predictor for crop yields incorporating a data assimilation–crop modelling framework. Land use/land cover maps derived from satellite data were used for distinguishing irrigated from non-irrigated fields and crop types. Soil vegetation atmosphere transfer model based on forcing a prognostic root-zone water balance model with observed rainfall and predicted evapotranspiration is used to estimate crop water requirements. The understanding of the atmosphere-crop-soil dynamics in the Banat region will contribute to a better prediction of the crop water requirements. Based on this information, a GIS platform devoted to DIANA pilot area, will be implemented for facilitate the detection and integration of non-authorized water abstractions. This work is financed by the European Union’s H2020 research and innovation program under grant agreement No 730109 (DIANA Project).